## REPLACEMENT CLAIMS

1. (Twice amended) A method for removing polymer etch residue from an etched opening in a silicon wafer device comprising:

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forming an opening in an insulating layer, wherein a polymer etch residue remains within said opening after the opening forming step; and

contacting said opening with a plasma to remove said polymer etch residue, said plasma generated from a gas consisting essentially of ammonia.

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6. (Amended) The method of claim 2, wherein said contacting is done at a temperature within the range of about 250-500° C.

14. (Amended) The method of claim 1, further comprising forming a conductive layer at a bottom of said opening following said contacting step.

15. (Amended) The method of claim 1, wherein said contacting step produces silicon nitride at a bottom of said opening, said method further comprising removing said silicon nitride.

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16. (Amended) A method for removing polymer etch residue from an etched opening in a silicon wafer device, comprising the steps of:

contacting said opening with an oxygen containing plasma, stopping said oxygen plasma contacting before said polymer etch residue is completely removed and thereafter contacting said opening with a second plasma, said second plasma generated from a hydrogen containing gas.

17. (Amended) The method of claim 16, wherein said contact opening is an High Aspect Ratio (HAR) opening, and said second plasma contacting step is performed

under conditions effective to remove said etch residue without substantially increasing the size of said opening.

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18. (Amended) The method of claim 17, wherein said second plasma contacting occurs in the absence of oxygen.

20. (Amended) The method of claim 18, wherein said second plasma contacting is performed at a temperature within the range of about 250 – 500° C.

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21. (Amended) The method of claim 18, wherein said second plasma contacting is performed in a reactor operating in a power range of about 500 – 5000 watts.

22. (Amended) The method of claim 20, wherein said second plasma contacting is performed at a temperature of about 350°C.

24. (Amended) The method of claim 21, wherein said second plasma contacting is performed at a flow rate within the range of about 100 to 4000 SCCM.

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25. (Amended) The method of claim 15, wherein said second plasma contacting is performed for a period of time sufficient to remove said residue from a bottom of said opening.

26. (Amended) The method of claim 25, wherein said bottom of said opening is not oxidized during said second plasma contacting step.

29. (Twice amended) A method of forming a contact opening in a semiconductor device, comprising:

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a) etching a contact opening in an insulative layer in said device down to a polysilicon element of said device;

b) contacting said opening with an oxygen plasma to remove a portion of said etch residue; and

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c) cleaning etch residue from said etched opening by contacting said opening with a plasma generated from a hydrogen containing gas in the absence of added oxygen.

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37. (Amended) The method of claim 34, wherein said contacting is performed at a gas flow rate of 750 SCCM.

50. (Amended) A method of forming an integrated circuit structure comprising:

forming an insulating layer over a polysilicon region;

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forming a high aspect ratio contact opening in said insulating layer down to said polysilicon region using a fluorine containing gas;

removing polymer residue from said contact opening using a plasma consisting essentially of ammonia gas which provides an oxide free bottom of said contact opening, and which does not substantially increase size of said opening;

forming a silicide layer at the bottom of said opening in contact with said polysilicon layer;

forming a conductor in said opening in electrical contact with silicide layer.

54. (New) A method for removing polymer etch residue from an etched opening in a silicon wafer device comprising:

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forming an opening in an insulating layer, wherein a polymer etch residue remains within said opening after the opening forming step; and

contacting said opening with a plasma to remove said polymer etch residue; said plasma generated from a gas consisting essentially of hydrogen gas.

55. (New) The method of claim 54, wherein said opening is a High Aspect Ratio (HAR) contact opening.

56. (New) The method of claim 55, wherein said contacting is performed under conditions effective to remove said etch residue without substantially increasing the size of said opening.

57. (New) The method of claim 56, wherein said opening is contacted with hydrogen gas in the absence of oxygen.

58. (New) The method of claim 55, wherein said contacting is done at a temperature within the range of about 250 - 500° C.

59. (New) The method of claim 58, wherein said contacting is performed in a plasma reactor within a power reactor range of about 500 - 2500 watts.

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60. (New) The method of claim 59, wherein said contacting is performed within a power range of about 1500 - 2000 watts.

61. (New) The method of claim 59, wherein said contacting is performed with a hydrogen gas flow rate within the range of about 500 to 1000 SCCM.

62. (New) The method of claim 61, wherein said contacting is performed at power of about 1900 watts and a temperature of about 350°C.

63. (New) The method of claim 62, wherein said contacting is performed with a hydrogen gas flow rate of about 750 SCCM.

64. (New) The method of claim 61, wherein said contacting is performed for a period of less than about 100 seconds.

65. (New) The method of claim 64, wherein said contacting is performed for a period of not more than about 75 seconds.

66. (New) The method of claim 54, further comprising forming a conductive layer at a bottom of said opening following said contacting step.

67.(New) The method of claim 54, wherein said contacting step produces silicon nitride at a bottom of said opening, said method further comprising removing said silicon nitride.

68. (New) The method of claim 54, wherein said plasma contacting is performed for a period of time sufficient to remove said residue from a bottom of said opening.

69. (New) The method of claim 54, wherein a bottom of said opening is not oxidized during said plasma contacting step.

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70. (New) A method for removing polymer etch residue from an etched opening in a silicon wafer device comprising:

forming an opening in an insulating layer, wherein a polymer etch residue remains within said opening after the opening forming step; and

contacting said opening with a plasma to remove said polymer etch residue; said plasma generated from a gas consisting essentially of methane gas.

71. (New) The method of claim 70, wherein said opening is a High Aspect Ratio (HAR) contact opening.

72. (New) The method of claim 71, wherein said contacting is performed under conditions effective to remove said etch residue without substantially increasing the size of said opening.

73. (New) The method of claim 72, wherein said opening is contacted with methane gas in the absence of oxygen.

74. (New) The method of claim 71, wherein said contacting is done at a temperature within the range of about 250 - 500° C.

75. (New) The method of claim 74, wherein said contacting is performed in a plasma reactor within a power reactor range of about 500 - 2500 watts.

76. (New) The method of claim 75, wherein said contacting is performed within a power range of about 1500 - 2000 watts.

77. (New) The method of claim 75, wherein said contacting is performed with a methane gas flow rate within the range of about 500 to 1000 SCCM.

78. (New) The method of claim 77, wherein said contacting is performed at power of about 1900 watts and a temperature of about 350°C.

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79. (New) The method of claim 78, wherein said contacting is performed with a methane gas flow rate of about 750 SCCM.

80. (New) The method of claim 77, wherein said contacting is performed for a period of less than about 100 seconds.

81. (New) The method of claim 80, wherein said contacting is performed for a period of not more than about 75 seconds.

82. (New) The method of claim 70, further comprising forming a conductive layer at a bottom of said opening following said contacting step.

83.(New) The method of claim 70, wherein said contacting step produces silicon nitride at a bottom of said opening, said method further comprising removing said silicon nitride.

84. (New) The method of claim 70, wherein said plasma contacting is performed for a period of time sufficient to remove said residue from a bottom of said opening.

85. (New) The method of claim 70, wherein a bottom of said opening is not oxidized during said plasma contacting step.

86. (New) The method of claim 16, wherein said hydrogen containing gas is ammonia gas.

87. (New) The method of claim 16, wherein said hydrogen containing gas is hydrogen gas.

88. (New) The method of claim 16, wherein said hydrogen containing gas is methane gas.

89. (New) The method of claim 30, wherein said hydrogen containing gas is ammonia gas.

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90. (New) The method of claim 30, wherein said hydrogen containing gas is hydrogen gas.

91. (New) The method of claim 30, wherein said hydrogen containing gas is methane gas.

92. (New) A method of forming an integrated circuit structure comprising:

forming an insulating layer over a polysilicon region;

forming a high aspect ratio contact opening in said insulating layer down to said polysilicon region using a fluorine containing gas;

removing polymer residue from said contact opening using a plasma consisting essentially of hydrogen gas which provides an oxide free bottom of said contact opening, and which does not substantially increase size of said opening;

forming a silicide layer at the bottom of said opening in contact with said polysilicon layer;

forming a conductor in said opening in electrical contact with silicide layer.

93. (New) A method as in claim 92, further comprising removing a portion of said polymer residue from said contact opening with oxygen prior to using said gas which provides an oxide free bottom of said contact opening.

94. (New) A method as in claim 92, wherein said silicide layer is a titanium silicide layer.

95. (New) A method of forming an integrated circuit structure comprising:

forming an insulating layer over a polysilicon region;

B9 forming a high aspect ratio contact opening in said insulating layer down to said polysilicon region using a fluorine containing gas;

Cancl'd removing polymer residue from said contact opening using a plasma consisting essentially of methane gas which provides an oxide free bottom of said contact opening, and which does not substantially increase size of said opening;

forming a silicide layer at the bottom of said opening in contact with said polysilicon layer;

forming a conductor in said opening in electrical contact with silicide layer.

96. (New) A method as in claim 95, further comprising removing a portion of said polymer residue from said contact opening with oxygen prior to using said gas which provides an oxide free bottom of said contact opening.

97. (New) A method as in claim 95, wherein said silicide layer is a titanium silicide layer.